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"Opportunities Are There"

Q&A With Grant Swinger: Upbeat About the Future

Following is another in SGR's series of occasional interviews with Dr. Grant Swinger, Director of the Center for the Absorption of Federal Funds.

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Q. Dr. Swinger, it is widely agreed that very difficult times lie ahead in the science area. What are your expectations for the new Administration?

Swinger. We see many opportunities, new and old. The Center was founded with the motto, "As long as you're up, get me a grant." We do not follow the crowd in yielding to pessimism.

Q. Please be specific about the opportunities.

Swinger. Okay, but first it's important to understand some basic facts about this business. Every presidency comes with political and economic themes that can bring riches to the R&D community—for those who tune in and get moving.

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Q. Examples.

Swinger. It was space and the moon landing with Kennedy. Johnson was into poverty research; you know, the social sciences. Nixon had the War on Cancer. With Carter, it was solar energy and windmills. They were bush league compared to Reagan. Reagan cranked up the Cold War and started SDI, the Space Station, the Supercollider, the Genome Project. Anyone who couldn't get a piece of the action from those Administrations didn't deserve to be in the business.

Q. And Bush?

Swinger. Until the election came along, he just went along with what Reagan left him, including the ban on fetal tissue research. He didn't do anything new until the election campaign began. Then, he started talking about technology and industry and how to get government labs into the picture. All last-minute stuff that accomplished nothing. Fortunately, there was enough momentum from the past to keep things going for our community. Consider, for example, critical technologies.

Q. There have been many studies of critical technologies, and now we even have a federal Critical Technologies Institute.

Swinger. Exactly. The situation represents a triumph. Everyone knows what the critical technologies are. At least a dozen lists have been drawn up in the last five years, and they're all the same. Any government or industry that needs a list to recognize critical technologies is so far out of it that the list won't do any good. But the opportunity remains strong. Listing critical technologies will be a growth sector for the rest of the decade.

Q. What does that mean for the Center for the Absorption of Federal Funds?

Swinger. Oh, we'll be going at it with full force. For starters, we're organizing a conference. It will be multidisciplinary, international, tele-conferenced, equal opportunity—the full treatment. And we'll issue a report,

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In Brief

"They should soon be coming out of the underbrush," White House Science Adviser D. Allan Bromley told SGR on Oct. 6 when asked whether the Bush campaign would field a counterpart to the big-name Scientists and Engineers for Clinton-Gore [SGR October 15]. Within days of the election, however, nothing had emerged. The Bush camp could, of course, assemble a list, but could it match the Nobel science glitter [12 in all] or the academic rank of the Clinton-Gore contingent?

New in the White House science-advisory system: The Intergovernmental Science, Engineering and Technology Advisory Council, announced October 27 by Bromley, who will serve as Chairman. Acronymed as Inter-SET, the Council is intended to link federal, state, and local S&T and related activities. The dozen or so members include the Director of NSF and officials of state and local governments from around the country. Quarterly meetings are planned.

Cornelius J. Pings, Provost at USC, has been named President of the Association of American Universities, succeeding Robert M. Rosenzweig, who built the Washington-based organization into an effective lobby for big-league academic research. Joe B. Wyatt, Chancellor of Vanderbilt University, has been elected AAU Chairman, succeeding Richard Atkinson, Chancellor of UC San Diego.

A monthly newsletter, Science & Technology in Congress, *has been launched by the Carnegie Commission on Science, Technology, and Government. Introductory subscriptions are free. Order from: Carnegie Commission on Science, Technology, and Government, 1616 P St. NW, Suite 400, Washington, DC 20036; tel. 202/332-2221.*

. . . Surveys Show Deep Public Ignorance of Science

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including a list of critical technologies.

Q. Frankly, that doesn't sound like much.

Swinger. You fail to understand. Conferences and reports are the tip of the iceberg. They don't just happen. The first step is to organize a steering committee to apply for a planning grant.

Q. And then?

Swinger. You can go various ways, depending on the circumstances. But, in general, next you hold a workshop, from which you develop a task force. An advisory committee will have to be appointed, and it will have a subcommittee or two or three. Trust me. NSF is a sucker for this process and will put up the money. They're very keen for meetings and reports at NSF. Nice covers and bindings on the report can make a big difference. Then comes the conference. And, of course, a year or two later, the proceedings of the conference are published.

Q. A year or two later? Why does it take so long?

Swinger. By the time we're ready to begin work on the proceedings, people are busy with other conferences that have come along. It's hard to find time for putting their papers in shape for publication. Getting out the proceedings is a problem, but no one seems to mind if it takes a couple of years. No one ever reads proceedings. For a test, we once included a string of the foulest language in a proceedings volume and we never heard a peep from anyone.

Q. I see. Where else do you see growth areas?

Swinger. Scientific and engineering manpower remains a golden subject.

Q. Why is that?

Swinger. Because there's no way of knowing how much manpower we'll need and how much we'll have. So, anything goes. You can argue for shortage and you can argue for oversupply. And to show how these things grow, you can do neither and argue for developing new methodologies—a big field now. Again, our friends at NSF have been just wonderful. Conferences, workshops, task forces, etc. The whole bundle.

Q. Well, with a lot of people with degrees unable to find jobs, isn't it difficult to make a case for a shortage?

Swinger. No question, and the situation is made worse by all those Russian scientists happy to work for us for $60 a month. But you run into certain difficulties if you argue that oversupply is the problem. The university system is built to produce more and more manpower. That's what it exists for. It doesn't know how to do anything else. You step on a lot of toes if you say there's going to be an oversupply. You've got to be sensitive to these problems. We've got postdoc physicists stacked 12 deep waiting for jobs, and we hear Nobel physicists calling for the production of more physicists, and saying the country will sink if we don't train even more. Some of the post-docs will soon be eligible for promotion to post-doc emeritus. But if you talk about oversupply, you get a lot of people upset.

Q. Where else do you see growth?

Swinger. Scientific literacy—you know, public understanding of science and that stuff. What the public doesn't know about science could keep everyone busy for the next century. The ignorance is astonishing, and it offers wonderful opportunities.

Q. Really?

Swinger. Surveys of public knowledge of science are big and you can never have enough of them. And they turn up all kinds of evidence of the depth of this problem. It puts me in despair.

Q. For example.

Swinger. In one survey, 62 percent of the respondents identified gluteus maximus as a Roman emperor. We had 47 percent saying a mammogram is a Mother's Day greeting. They say fellatio is a character in Hamlet. An amazing percentage think cunnilingus is an Irish airline. They think reverse transcriptase has something to do with shorthand, and a gyroscope is a kind of sandwich. We didn't dare ask about the ozone hole.

Q. What can be done?

Swinger. We have to struggle against this tide of ignorance at every opportunity. We have to proclaim the importance of science. We can take inspiration from the writings of Dr. Boringall, the distinguished editor of *Sinus* magazine, published by the American Association for the Retardation of Science.

Q. What does he say?

Swinger. He is an unabashed supporter of science. He has saluted science in every respect, even for "Humanizing war" with precision weapons. He has written, "Science did not create warfare, but its advances can remove some of war's barbarities..." That's preposterous, of course, given the destructiveness of modern weapons, as we've seen in the Gulf War and in what used to be Yugoslavia. But it's in the right spirit.

Q. In general, then, Dr. Swinger, you are optimistic about what lies ahead.

Swinger. The opportunities are there.

Q. Thank you, Dr. Swinger.—DSG

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Science Elite Rallies to Re-Elect Rep. George Brown

Rep. George Brown has often remarked that his devotion to science is reciprocated at all seasons, except when it counts for a Congressman—election time. The California Democrat, who chairs the House Science, Space, and Technology Committee, has been medaled and praised by the scientific establishment, at whose rostrums he often performs as Capitol Hill's sole statesman of science policy. Lacking, however, have been campaign money and endorsements from the beneficiaries of his long career as champion of science.

But this year, the establishment has wised up and gone political in behalf of Brown, who is in a difficult battle for re-election. Sensing the danger, some 30 grandees of science have publicly endorsed Brown and pitched in to raise at least $40,000 for his campaign. SGR is informed that the assemblage was put together in consultations between Brown's Congressional staff members and a senior staff member at the National Academy of Sciences. "The fact that so many of our nation's best and brightest scientists want George Brown reelected is a testament to Chairman Brown's stature within the scientific community," said Nobel physicist Leon Lederman in a statement on an October 19 press release headed, "Friends of George Brown."

Scientific mobilizations on the Brown style have occurred at the Presidential level in past elections, as well as in this one [SGR, October 15: "Scientists Council for Clinton-Gore: The Full Roster"]. But this is the first time that the big-league old-boy-and-girl network has gone to work for a member of Congress. Does this signify a new level of political activism within science, or is the outpouring of cash and support Brown-specific? Hard to say, but of all the major professions on the American landscape, science is perhaps the last to jump into political conflict at the Congressional level.

What's notable is that Democrat Brown's announced backers include several past and present sci/tech appointees of Republican Administrations. Among them are two members of the President Bush's Council of Advisers for Science and Technology: Mary L. Good, Allied-Signal, Inc., Senior Vice President for Technology, and John McTague, Ford Motor Co. Vice President for Technical Affairs. McTague was a member of the White House Office of Science and Technology Policy in the Reagan Administration and served for a time as Acting Science Adviser to President Reagan.

Also in the Brown contingent is H. Guyford Stever, who served as Gerald Ford's Science Adviser, and John A. Young, Hewlett-Packard CEO, a longtime Republican whom Reagan appointed to the chairmanship of the President's Commission on Industrial Competitiveness, precursor of the private Council on Competitiveness. (Young, along with a group of Silicon Valley executives, conspicuously declared for Clinton in September.) None of these links to relatively minor government posts precludes political involvement on the opposite side of the partisan fence, but it is unusual.

Joining in support of Brown was a contingent of Nobel laureates, consisting of, in addition to Leon Lederman, Paul Berg, Murray Gell-Mann, Joshua Lederberg, Yuan T. Lee, Burton Richter, and Glenn Seaborg.

Also on the list: Lewis Branscomb, Harvey Brooks, Sydney Drell, Donald Langenberg, William F. Brinkman, Roland Schmitt, Alvin W. Trivelpiece, and Maxine Singer.

A fund-raising letter from the Brown group states, "This is a non-partisan effort, with the support of both Democrats and Republicans, to help re-elect an extremely capable public official who has risen to the Chairmanship of one of the most important committees for science and engineering in the US Congress."

Brown, first elected to Congress in 1962, has been redistricted into a Southern California electorate that's about 50 percent Democratic. His opponent, Dick Rutan, pilot of the around-the-world *Voyager* flight in 1986, is reported to have heavy financial backing from Republican campaign sources. And Rutan is riding the anti-incumbency issue against one of the most senior members of the Congress—a 14-termer, age 72.

The establishment's affection for Brown derives more from his sympathy for its concerns than the power that he wields as Chairman of a Committee with the inflated title of Science, Space, and Technology. The Committee has direct law-writing jurisdiction over NSF, NASA, the National Institute of Standards and Technology, EPA research, the National Weather Service, and a few odds and ends. Its powers over energy research are confusingly shared with other committees. Beyond that, it has no authority over appropriations or any part in defense, medical, or agricultural research, which comprise some two-thirds of federal R&D expenditures.

But Brown has made the most of a slender base in Congressional politics and a devout belief in the importance of science—his biographical note in the *Congressional Directory* lists a UCLA bachelor's degree in "industrial physics," and he sometimes refers to himself as a physicist. In the two years that he has held the SS&T Chairmanship, he has reached out to the scientific and technical communities and embraced many of their major causes.

He successfully led the fight to salvage the Superconducting Super Collider after the House killed its budget last June, and he has shepherded the Space Station through hostile territory to the magic point of so much having been spent that it's too late to terminate the boondoggle. Brown talks the lingo of science policy, and employs a paternalistic manner toward the establishment's leaders, lecturing on the importance of developing priorities and various other chimerical notions in science and government relations.

In their quest for attention on Capitol Hill, the chieftains of science consider George Brown a rare prize, which accounts for their unprecedented embrace of a Congressional candidacy.—DSG

NASA Head Tells of Battles to Change the Agency

With its high-powered public-relations operation, NASA long-ago was tagged as standing for Never A Straight Answer. But blunt talk at the top has been the standard at the space agency since last April, when the White House abruptly ousted Richard Truly as Administrator and replaced him with Daniel S. Goldin, Vice President and General Manager of the TRW Space Technology Group. Since then, the agency, renowned for immunity to change, has been in bureaucratic turmoil as Goldin has moved quickly to put his policies into operation. Goldin spoke to the DC Science Writers Association on October 26. Following are excerpts from the Q&A portion of the program, transcribed and edited by SGR.

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Q. *A lot has been written about the traditional NASA culture and the difficulties you've encountered in trying to change it.*

Goldin. Let me first say that there are very, very good people at NASA. But there are very, very good people that have been trapped by getting into a mentality that we'll do the best we can within what I'll call a jobs program. Now, that's an overstatement. Clearly, NASA has done wonderful things. COBE [Cosmic Background Explorer] did terrific things, and some of the ultra-violet and infra-red probes we had, and some of the planetary probes. We're doing wonderful things on the Shuttle right now with micro-gravity and life science. But we kind of got a little trapped, and we got a little bureaucratic. So, we've got to break that cycle. And we've got to start taking more risk and not playing it safe. And we have to have more of a mission-oriented organization, rather than a functional organization, because when you have a functional organization, you don't have that freedom of spirit. .

Aeronautics: It's N-A-S-A, big N, big A, big S, big A. It's not small A, big S. We have completely lost contact with what we have to be doing in aeronautics. It's a very critical mission of NASA. Aeronautics was submerged into a bunch of whole technology programs. There was a wonderful bureaucracy built around it, dedicated to the status quo. America has lost 22 points of market share since 1970 in aeronautics. We had 90 percent in 1970, and in 1991, we were down to 68 percent and still dropping. There are some fundamental cutting-edge technologies that have to be brought to the fore if we want to have a very vigorous aeronautics program which supports a very critical industry in this country. We've given up on consumer electronics, entertainment electronics, we're giving up on automobiles, and we give up on commercial aircraft. Aeronautics now reports out separately [in NASA].

Another change that we made was, I went around and I talked to small businesses. I talked to people in universities. I talked to entrepreneurs. They said, "It is impossible to come to NASA with a new idea. There is no place I could go in NASA where anyone would listen to me." We have a commercial area. We have five utilization offices. We have five tech-transfer offices. It's all over the place. But where do you go with bright new ideas as an entrepreneur? So, we formed a new organization called the Advanced Concepts and Technology Organization, and we have combined that with the commercial activities and the tech transfer activities. Because, if you want to be on the cutting edge, you ought to be on the cutting edge in every respect. We're going to put out a big welcome sign and say, we don't worry about not-invented-here. We want fresh ideas to come into NASA. So we did that. And we tried to structure NASA to be more mission-oriented and to remember that there's a customer. And that customer is the American public. Not the scientific community. The scientific community is not our customer.

Our whole structure is set up, our whole advisory structure is set up, so that we answer to the scientific community—the people that partake in the NASA budget. Is that the right organization? I don't know. I think we need to re-look at that. We have to be responsive to the American people. The other thing that we're doing is we're having a series of seven town-hall meetings, at which the Administrator is going to speak and listen. We're going to Tampa, Raleigh-Durham, Hartford [Conn.], Indianapolis, Denver, Seattle, and Los Angeles [for meeting times and places: 202/453-3006]. We're asking anyone that wants to come, to come and we're going to tell you about the NASA program and we want to get your feedback.

Q. *Other Administrators have tried to change the NASA culture, and it's waited them out and reverted back to the old ways after the Administrator left. What are you doing differently from your predecessors?*

Goldin. I didn't come to NASA to be loved. That is not my intention. I came with a passion, because I think the space program is so important to this nation, it has to be given back to the American people. Now let me tell you, 90 percent, 95 percent of the NASA employes are absolutely dedicated to that. There are those who don't want change and will fight it with all they've got, and it's gotten very ugly. There are barricades up in the street. But that's the way it goes. But that's inside the Beltway. Go outside the Beltway. It's not that way. They have to give up control of the nation's space program to the American people. Now, are they going to try and get me? They can try. I'll do my best not to let them get me. If America decides they want a space program, they're not going to put up with this crap anymore.

Q. *What's in the future for NASA's budget?*

Goldin. The NASA budget doubled from '83 to '92. I don't think it's going to double again over the next decade. Yes, there may be some increases, but I don't see that we're going to have tremendous growth. What we're going to have to do is take a look at how we could do things in smaller bites and shorter periods of time. We're going to have to have smaller programs. One of the fundamental things we're

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. . . Planetary Program "Just as Sick" as the Shuttle

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going to have to do is transfer to a state where you launch a multiplicity of smaller things. And then you say, if I launch 10 things a year, and I lose two, it's okay. So, I can go on the cutting edge and I won't be afraid anymore, and I take risks. When I go to the cutting edge, I get real aggressive technology, I get tremendous learning, and I start doing things in a shorter period of time. It doesn't have to take a decade to build a spacecraft. It can be done in three or four years.

Q. *How have you changed things at NASA?*

Goldin. I came thinking I'd be able to move a lot faster than I could. We've proposed a number of small [satellite] programs. We're trying to increase those programs. We're trying to bring down the cost of the Shuttle. When I came, they had talked about taking the cost down three percent a year, and taking it down 15 percent over five years. Now they've taken a much more aggressive role. At the same time, they're adding upgrades to the Shuttle to improve its safety. And, they're adding in a Russian mission without any new money. As a result of the interaction we had, they volunteered to save 17 percent out of the out-year growth of the budget.

Q. *Where do you see the Space Station going? It's been ratcheted down and down.*

Goldin. The primary purpose of Space Station *Freedom* is not to cure cancer, or AIDS, or solve world hunger. The purpose of Space Station *Freedom* is to understand how humans can live in space. There's been a lot of talk about the other things, but that's the purpose of the Space Station. We need the capacity to do that. The space program used to be a man-in-a-can. You shoot him up, you bring him down, you measure him before and after. But that doesn't tell you how the hormonal balance works in the body, that doesn't tell you why the immune system changes, why the fluid comes up and why you could black out as you come back into gravity. Those are the things we have to understand. While we do those things, we're going to add some pay-as-you-go. Because we have this laboratory, we can do micro-gravity research, we can do life-science research.

But we are not doing Space Station to do micro-gravity, which is how a lot of people want to justify the Space Station. You can't justify it on that grounds. You justify it because you want to have humans in space, and move out. That's the primary reason.

Q. *To what extent do you think NASA might be able to fill the role of a civilian mission for defense conversion?*

Goldin. I submit that we must have a higher purpose in life at NASA than to be a defense-conversion agency, and if we are not on a higher purpose, we should not exist. Given that we exist, if we could pull in some of the slack from defense, that's fine. But we cannot and should not become a jobs program. That's been part of the problem with NASA. NASA, over the last 20 years, lost its innocence, and it went from inspiration to jobs. And we've got to wean ourselves from being a jobs program. We have so much to offer our society: inspiration, hope, opportunity, and a catalyst for peace. And then, if we could solve defense conversion, fine. If we can't, shut us down.

Q. *There are forecasts of a budget slump for NASA. What's the future of the budget and, in particular, the future of space science?*

Goldin. I don't know whether there's going to be a budget slump. But I feel strongly, in the next year or two, we must start a variety of small missions where we have spacecraft weighing hundreds of pounds, maybe up to a thousand pounds, instead of 10,000 pounds. And these spacecraft might cost a $100 million, $200 million to develop, instead of billions. I believe it's possible in the next two decades to send a small robotic spacecraft to every critical body in the solar system. And do these programs in years instead of decades. Orbit, land, have micro-rovers—unbelievable technology, these micro-rovers. And then, with these little micro-probes, bring back samples that are tens of grams. You don't need 800 pounds of lunar rock, or 800 pounds of rock from an asteroid, to understand what's there. I also believe that within 20 years, we could have the next major international research facility, on the moon. We can do [on the moon] unbelievable astrophysical research, which is important for us as a society, and we can't back away from that, and it doesn't have to cost $200 billion. It can cost tens of billions internationally.

Q. *The space science program has been hit hard by budget cuts.*

Goldin. Let me deal with the planetary program. There's tremendous criticism of the Shuttle, and there should be. There's tremendous concern with the Space Station and there should be. But, let me tell you, the planetary program is just as sick, and let me recite some numbers for you. The nation's planetary program has been reduced to one program—Cassini [a Saturn orbiter], that's all we got. Cassini is going to cost not $1.4 billion as advertised. That's just the development cost. And the money for the software that goes with Cassini has been pushed out of the mission operations and data analysis. They'll do it while it's traveling on its way to Saturn: $1.4 billion for mission operations and data analysis; that's $2.8 billion; $400 million for a launch vehicle; that's $3.2 billion; $800 million for a probe, which the Europeans are supplying. That's $4 billion. Four billion dollars! Now, we had CRAF [Comet Rendezvous Asteroid Flyby] Cassini for $1.6 [billion], and last year, CRAF was taken out, so we went down to $1.4 [billion].

My contention is people only look at the human space flight program. But the same problem we have in human space flight is in the planetary program. So, unless we fix NASA completely, in all aspects, we will not have a robust space program. But let me come back to the point I'm trying to make. There is only peer review for the NASA program

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. . . Says NASA Lacks Ties to University Community

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within the NASA community. The scientists that partake in the NASA program are part of the review process. The people in the industry are on the advisory panels. These are the people that set requirements and priorities and then, quote, the scientific community has spoken.

Q. *What do you mean when you say you want to bring the American people into the space program?*

Goldin. I've had presidents of universities come to me and say, "We want to participate. How can we participate in the program? We're not part of the program, we want to be part of it." We've got to bring in the university community. We have not brought in the broad range of American industry. One of the things I've tried to do is have an office of the Chief Scientist of NASA who will reach out and spend his time meeting with the presidents of Caltech, and MIT, and Stanford, and University of Indiana. They have a wonderful life-science program at the University of Indiana. And go out and talk to the EPA [Environmental Protection Agency]. I'll give you an example. One of the major problems on the high-speed civil transport is not the technology—we could do the technology. The real problem is the interaction problem with the regulators. The chief executives of every major [aircraft] corporation say, Our concern is, we're going to develop this thing, but we'll never know when it's going to be stopped on NOX emissions. Till we get it down an order of magnitude? Is that enough? We go do the development, we go to the banks, we get the financing, we go start building the plane, and all of a sudden they say, "Ah, we're going to move the goal line." Same thing on noise. And what we've been doing is that we've been living in a set of smokestacks at NASA. The aeronautics community has been working the technology for the aeronautics and we've been completely disconnected—I'm exaggerating a bit—from the scientific community and the EPA, and the FAA, and the international licensing organizations. It's not just going to John Q. Public, but linking ourselves up.

We're not connected to the American Society of Mechanical Engineers. The IEEE [Institute of Electrical and Electronics Engineers]. I had them come into my office and it was a session that was very, very painful. They told us all the things they thought NASA was doing wrong and why they testified in Congress against NASA. So, I said, "Why didn't you come in and tell us what's wrong?" They said, "We were afraid to." So, now we've been reaching out to the different engineering societies. NASA has to be integrated into the total infrastructure of the country, and that's what I mean by "talking to the American people." I spent the last six months talking to CEOs, members of Congress, I've gone out to small towns; in fact, today I went to Drew University [New Jersey] so I could talk to a physics class. I've been personally trying to get a cross-section of all these things to get a sense from America. I've talked to 70 taxi drivers, to ask them what they think. I contend that NASA in the last 20 years has not been connected with the American public.

Q. *What does the American public want?*

Goldin. Exploration. A lot of them are saying that they want exploration and—

Q. *Then why are you spending all that money on the Space Station?*

Goldin. —they want planetary science. Because you cannot have exploration until you could understand how humans could live and work in the space environment. There are fundamental problems in the human physiology that prevent you from doing that. You cannot go into space and have one percent bone loss per month. There are just fundamental issues that have to be resolved. Now, if Space Station *Freedom* is not the right machine, well, hopefully, we could find a better one. So far, we haven't, but we're trying. We're trying to begin a relationship with the Russians, but the Russian program—I don't know if it could vaporize today or tomorrow. So, we're doing some confidence-building measures to get to know the Russians and see in the next year or two if they'll survive. We can't put their program in series with ours now. People say, "Go buy a *Mir* space station." I don't know if Russia is going to be there in a year or two. All we're going to try to do is go as fast as we can to get as focused as we can to bring the program under control.

Q. *A report of the National Research Council [*Aeronautical Technologies for the 21st Century*—SGR, Oct. 15, IN PRINT] recommended more government support for aeronautical research.*

Goldin. If we want to compete worldwide, we have to have the very best technology, and we have to have higher productivity, and NASA has got to support that. Those are the issues we have to face and we have to see how we prioritize them. But I don't see how we can prioritize within 7 percent of the NASA budget [for aeronautical research]. We're going to have to spend more money and, by the way, if I have anything to say about it, if we have to cancel some space programs to increase the aeronautics budget, we will. Because aeronautics has been neglected too long.

Q. *How quickly after you get a signal that looks real in SETI [Search for Extra-Terrestrial Life] will you tell us, and what will you tell us?*

Goldin. We're going to tell everybody, because they paid for it. But, first, we're going to try and make sure it's a real signal. Then we're going to try and stop the rush of those that want to win the Nobel Prize and kill each other to make the announcement. We'll try and find some equitable way to make the announcement.

[In concluding]. Look, I've taken some extreme positions in trying to make a point. NASA is not a bad organization and it's not bad people. But somehow it's gotten locked up unto itself. It's offered a lot to the country, but I think it could offer much more.

More IN PRINT: Alternative Fuels, AIDS, Drug Prices

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Alternative Fuels: Experiences of Brazil, Canada, and New Zealand in Using Alternative Motor Fuels *(GAO/RCED-92-119; 100 pp., no charge),* by the General Accounting Office (GAO), reporting on Brazil, where ethanol is the fuel for four-million vehicles (about 30 percent of that nation's total fleet), and Canada and New Zealand, where far smaller proportions burn compressed natural gas or propane. In all cases, the GAO found, "Government became the catalyst for action by encouraging industry to market alternative fuels and encouraging consumers to use them." Financial incentives, such as favorable pricing and assistance for conversion or purchase of vehicles, also figured. But the GAO notes that acceptance of alternative fuels in the three countries has been slow and cautious. In assessing the potential for the US, it concludes that gasoline won't be easily dislodged as the preferred fuel.

Also from the GAO (all at no charge): ***Sustainable Agriculture: Program Management, Accomplishments, and Opportunities*** (GAO/RCED-92-233; 45 pp.), a review of one of the least visible and initially unwelcome items in the sprawling US Department of Agriculture, the Sustainable Agriculture Research and Education program (SARE), a 1985 Congressional creation for which the Department didn't request funds until 1991. Focused on reducing the use of pesticides, fertilizers, and energy, SARE ran counter to the USDA passion for high-input farming. In the meantime, Congress pushed money for SARE into an unwilling USDA, financing, from 1988-92, 183 projects for a total of $26 million. The GAO says management of the program is fragmented within USDA and the Department "currently has no policy on sustainable agriculture to provide clear and comprehensive direction for the nine agencies involved." Nonetheless, despite the problems at the top, GAO concluded that the program "has been a catalyst in increasing interest in and acceptance of sustainable agriculture by individuals and institutions."

Pesticides: Adulterated Imported Foods Are Reaching US Grocery Shelves (GAO/RCED-92-205; 30 pp.), says the Food and Drug Administration finds prohibited pesticides on substantial volumes of imported fruits and vegetables. But many of the products, GAO states, reach the marketplace because FDA rarely prosecutes violations, while penalties imposed by the US Customs Service, which controls points of entry, "are low enough so that the importers can still profit from distributing the adulterated foods." GAO notes that half of the nation's fruits and vegetables are imported, and that about four percent of shipments tested by FDA in 1988-90 "contained prohibited pesticides."

AIDS: CDC's Investigation of HIV Transmission by a Dentist (GAO/PEMD-92-31; 50 pp.), in the highly publicized, first reported case of HIV transmission from a health worker to patients, GAO upholds the finding of the Centers for Disease Control that five HIV-positive patients became infected in the course of treatment by a dentist who later died of AIDS. The report faults the CDC for risking bias in the course of its investigation by not masking the source of genetic material from the dentist and one patient. But overall, it rates the CDC's investigation "thorough and competent."

Hospital Costs: Adoption of Technologies Drives Cost Growth (GAO/HRD-92-120; 40 pp.), says the adoption of new hospital-based technologies was the single most important factor in the 63 percent real increase in medical costs from 1980-89. Describing AIDS and malpractice as relatively small sources of costs increases, the GAO says costly technologies and skilled workers to operate them were far more potent factors in the rapid growth of health-care spending.

Prescription Drugs: Companies Typically Charge More in the United States Than in Canada (GAO/HRD-92-110; 37 pp.), says a GAO market survey found that a supply of 121 frequently dispensed drugs would cost 32 percent more in the US than in Canada. The price disparity, the report says, is due to governmental restraint on drug prices in Canada, and "not to any differences in manufacturers' costs between the two countries." The GAO adds, "It is not clear how such regulations would affect manufacturers' ability to develop innovative drug products."

Also available, a related GAO report: ***Prescription Drugs: Changes in Prices for Selected Drugs*** (GAO/HRD-92-128; 70 pp.), tracks price increases for 29 widely prescribed drugs from 1985-91.

Order GAO reports from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

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IN PRINT: German R&D, US-Israel Program, Etc.

The publications listed are obtainable as indicated—not from SGR.

The German Research Service: Special Science Reports (in English; $56, including postage), monthly newsletter, in lay language, published by a consortium of major German research organizations, government and private, presenting reports on German and European activities in the physical and social sciences, medicine, and the humanities. The September issue, 14 pp., includes articles on fusion research, deep-earth drilling, the Eastern European economy, climate change, current controversies about the Nazi era, and finance of research in Germany. Each article lists a name and address for obtaining further information.

Order from: Deutscher Forschungsdienst, Ahrstrasse 45 (Wissenschaftszentrum), Postfach 20 50 06, D 5300 Bonn 2, Germany; tel. (02 28) 30 22 10.

Partnership for Tomorrow: The US-Israeli Binational Agricultural Research and Development Fund (BARD; 56 pp., no charge), in slick magazine style, a report on the thriving but little-publicized bilateral collaboration in agriculture established by the US and Israeli governments in 1977. Since then, according to the report, 611 projects, about evenly divided between the two countries, have been funded for a total of over $100 million. Financed by an endowment of $110 million, BARD awards grants, averaging about $200,000 for three years, and finances fellowships and workshops. Copies of the report and guidelines and applications are available from BARD's US liaison office and the main office, in Israel.

Order from: US-Israel BARD, USDA-ARS, Room 107, Building 005, BARC-West, Beltsville, Md. 20705; attn. Lynn Gipe; tel. 301/504-5605;

US-Israel BARD, PO Box 6, Bet-Dagan 50250, Israel; tel. (972) 3-968-3230.

Enhancing Health Status: The Role of Academic Health Centers (86 pp., $3), from the Association of Academic Health Centers, which notes that "Academic health centers have sometimes been criticized for paying too much attention to illness and 'high-tech' medicine and too little attention to wellness and the needs of their communities." To evaluate the observation, the Association examined community-service programs at six institutions: University of Alabama at Birmingham; University of Kentucky, University of New Mexico, University of North Carolina at Chapel Hill, Rush Presbyterian-St. Luke's Medical Center (Chicago), and State University of New York Health Science Center at Brooklyn. All of them, it found, are engaged in community service of various types, which are described without a touch of skepticism. Marian Osterweis, Vice President of the Association, served as Principal Investigator for the study; Suzanne Finn Eichhorn was project consultant. The study, financed by the Henry J. Kaiser Family Foundation, is a followup to the Association's 1990 report *A Call to Action: Academic Health Centers and Health Promotion/Disease Prevention* (available for $3).

Order from: Association of Academic Health Centers, 1400 16th St. NW, Suite 410, Washington, DC 20036; tel. 202/265-9600.

Breaking from the Past: Setting New Ground Rules for Scientific Freedom and Responsibility in East-Central Europe and the Russian Federation (76 pp., no charge), from the American Association for the Advancement of Science (AAAS), report of discussions held in fall 1991 in the old Soviet bloc by Mark S. Frankel and Jane Cave of the AAAS Scientific Freedom, Responsibility and Law Program. An earnest effort, but given the passage of a year and reports published elsewhere on this large and turbulent territory, the effort adds little understanding to the subject. The project was supported by the AAAS and a planning grant from the National Science Foundation.

Order from: AAAS, Directorate for Science and Policy Programs, 1333 H St. NW, Washington, DC 20005; attn. Magby Callejas; tel. 202/326-6600.

Science and Engineering Programs: On Target for Women (216 pp., $19, plus $4 for shipping), from the National Academy of Sciences Committee on Women in Science and Engineering, papers from a conference held last November on the effectiveness of programs designed to encourage women to pursue careers in science and engineering. Participants included: Linda Wilson, President, Radcliffe College; Elizabeth Stage, Director, NAS National Committee on Science Education Standards and Assessment; Marsha Lakes Matyas, Director, AAAS Women in Science Program, and Esther Conwell, Research Fellow, Xerox Research Laboratories.

Also from the Academy: ***Computing the Future: A Broader Agenda for Computer Science and Engineering*** (272 pp., $24.95, plus $4 for shipping), report of the Committee to Assess the Scope and Direction of Computer Science and Technology established in 1990 and "charged with assessing how best to organize the conduct of research and teaching in computer science and engineering (CS&E)..." Among the recommendations: A bigger place for computer science and engineering in other fields of scholarship and $100 million a year in additional federal funds "to support interdisciplinary and applications-oriented CS&E research in academia that is related to the mission of the mission-oriented agencies and departments that are not now major participants" in the federal High-Performance Computing and Communications Program.

Order from: National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418; tel. 1-800/624-6242; in the Washington, DC, area: 202/334-3313.

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